mphocytopenia

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ocytopenia is a total lymphocyte count of < 1000/μL in adults or < 3000/μL in children < 2 yr. Sequelae include unistic infections and an increased risk of malignant and autoimmune disorders. If the CBC reveals lymphocytopenia, for immunodeficiency and analysis of lymphocyte subpopulations should follow. Treatment is directed at the underlying er.

rmal lymphocyte count in adults is 1000 to 4800/μL; in children < 2 yr, 3000 to 9500/μL. At age 6 yr, the lower limit of l is 1500/μL.

and T cells are present in the peripheral blood; about 75% of the lymphocytes are T cells and 25% B cells. Because ocytes account for only 20 to 40% of the total WBC count, lymphocytopenia may go unnoticed when WBC count is checked t a differential.

l Calculator: Absolute Lymphocyte Count

65% of blood T cells are CD4+ (helper) T cells. Most patients with lymphocytopenia have a reduced absolute number of T articularly in the number of CD4+ T cells. The average number of CD4+ T cells in adult blood is 1100/μL (range, 300 to L), and the average number of cells of the other major T-cell subgroup, CD8+ (suppressor) T cells, is 600/μL (range, 100 to).

logy

ocytopenia can be

cquired

herited

red lymphocytopenia

ed lymphocytopenia can occur with a number of other disorders (see Table: Causes of Lymphocytopenia). The most on causes include

rotein-energy undernutrition

IDS and certain other viral infections

-energy undernutrition is the most common cause worldwide.

the most common infectious disease causing lymphocytopenia, which arises from destruction of CD4+ T cells infected IV. Lymphocytopenia may also reflect impaired lymphocyte production arising from destruction of thymic or lymphoid cture. In acute viremia due to HIV or other viruses, lymphocytes may undergo accelerated destruction from active ons with the virus, may be trapped in the spleen or lymph nodes, or may migrate to the respiratory tract.

enic lymphocytopenia is caused by cytotoxic chemotherapy, radiation therapy, or the administration of antilymphocyte n (or other lymphocyte antibodies). Long-term treatment for psoriasis using psoralen and ultraviolet A irradiation may y T cells. Glucocorticoids can induce lymphocyte destruction.

ocytopenia may occur with lymphomas, autoimmune diseases such as SLE, rheumatoid arthritis, myasthenia gravis, and -losing enteropathy.

ited lymphocytopenia

ed lymphocytopenia (see Table: Causes of Lymphocytopenia) most commonly occurs in

evere combined immunodeficiency disorder

Viskott-Aldrich syndrome

occur with inherited immunodeficiency disorders and disorders that involve impaired lymphocyte production. Other ed disorders, such as Wiskott-Aldrich syndrome, adenosine deaminase deficiency, and purine nucleoside phosphorylase ncy, may involve accelerated T-cell destruction. In many disorders, antibody production is also deficient.

Causes of Lymphocytopenia

ism	Examples
	AIDS
	Other infectious disorders, including hepatitis, influenza, TB, typhoid fever, and sepsis
	Dietary deficiency in patients with ethanol abuse, protein-energy undernutrition, or zinc deficiency
d	Protein losing enteropathy
	Iatrogenic after use of cytotoxic chemotherapy, glucocorticoids, high-dose psoralen and ultraviolet A radiation therapy, lymphocyte antibody therapy, immunosuppressants, radiation therapy, or thoracic duct drainage
	Systemic disorders with autoimmune features (eg, aplastic anemia, Hodgkin lymphoma, myasthenia gravis, protein-losing enteropathy, RA, chronic kidney disease, sarcoidosis, SLE, thermal injury)
	Aplasia of lymphopoietic stem cells
	Ataxia-telangiectasia
	Cartilage-hair hypoplasia syndrome
ary	Idiopathic CD4+ T lymphocytopenia
	Immunodeficiency with thymoma
	Severe combined immunodeficiency associated with a defect in the IL-2 receptor gamma-chain, deficiency of ADA or PNP, or an unknown defect
	Wiskott-Aldrich syndrome

denosine deaminase; PNP = purine nucleoside phosphorylase.

ptoms and Signs

ocytopenia per se generally causes no symptoms. However, findings of an associated disorder may include

bsent or diminished tonsils or lymph nodes, indicative of cellular immunodeficiency

kin abnormalities (eg, alopecia, eczema, pyoderma, telangiectasia)

vidence of hematologic disease (eg, pallor, petechiae, jaundice, mouth ulcers)

eneralized lymphadenopathy and splenomegaly, which may suggest HIV infection or Hodgkin lymphoma

ocytopenic patients experience recurrent infections or develop infections with unusual organisms. Pneumocystis jirovecii, egalovirus, rubeola, and varicella pneumonias often are fatal. Lymphocytopenia is also a risk factor for the development of s and for autoimmune disorders.

gnosis

linical suspicion (repeated or unusual infections)

BC with differential

Measurement of lymphocyte subpopulations and immunoglobulin levels

ocytopenia is suspected in patients with recurrent viral, fungal, or parasitic infections but is usually detected incidentally BC. *P. jirovecii*, cytomegalovirus, rubeola, or varicella pneumonias with lymphocytopenia suggest immunodeficiency. ocyte subpopulations are measured in patients with lymphocytopenia. Measurement of immunoglobulin levels should e done to evaluate antibody production. Patients with a history of recurrent infections undergo complete laboratory tion for immunodeficiency, even if initial screening tests are normal.

tment

reatment of associated infections

reatment of underlying disorder

ometimes IV immune globulin

ossibly hematopoietic stem cell transplantation

uired lymphocytopenias, lymphocytopenia usually remits with removal of the underlying factor or successful treatment of derlying disorder. IV immune globulin is indicated if patients have chronic IgG deficiency, lymphocytopenia, and recurrent ons. Hematopoietic stem cell transplantation can be considered for all patients with congenital immunodeficiencies and e curative.

ey Points

ymphocytopenia is most often due to AIDS or undernutrition, but it also may be inherited or caused by various infections, rugs, or autoimmune disorders.

atients have recurrent viral, fungal, or parasitic infections.

ymphocyte subpopulations and immunoglobulin levels should be measured.

reatment is usually directed at the cause, but occasionally, IV immune globulin or, in patients with congenital mmunodeficiency, stem cell transplantation is helpful.

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